

OFFICE OF MANNED SPACE FLIGHT PROGRAM DIRECTIVE	M-D <u>ML</u> <u>3200.116</u> (Project)	DATE OCT 22 1969
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APOLLO APPLICATIONS
PROGRAM DIRECTIVE NO. 31

TO: Distribution

FROM:


Director, Apollo Applications
Program

SUBJECT: The Implementation of AAP System Safety Requirements

- REFERENCES:
- (a) System Safety Requirements for Manned Space Flight, OMSF Safety Program Directive No. 1
 - (b) AAP Failure Mode and Effect Analysis; Single Failure Point Identification and Control, Apollo Applications Program Directive No. 13
 - (c) Manned Space Flight Awareness Program, NMI 1700.3

I. PURPOSE

The purpose of this directive is to implement the requirements of Reference (a) as it applies to the Apollo Applications Program.

II. SCOPE

This directive is applicable to all NASA/AAP organizations, their contractors and subcontractors who have responsibility for the direction or performance of AAP activities.

III. POLICY

It is a basic policy within the Apollo Applications Program that System Safety is an inherent function of the "in line" disciplines (i.e., design, test, manufacturing, reliability, operations) and should not be divorced from these disciplines. There is also a need for a separate and distinct System Safety function at the Centers and major contractors. The role of this function in the Apollo Applications Program shall be as follows:

- A. Establish System Safety Requirements.

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- B. Assure compliance with established System Safety requirements by means of 1) formal audits¹ of the "in line" disciplines (i.e., design, test, operations, reliability); 2) participation in program milestone reviews; and 3) formal review and concurrence in procedures to be used during hazardous testing, checkout, launch, and mission operations.
- C. Formal "tracking" and disposition of safety problems as identified in the various engineering analyses, mockup reviews, procedural reviews, etc.

IV. REQUIREMENTS

The "System Safety Requirements for Manned Space Flight", Reference (a) are to be implemented on the Apollo Applications Program but are not intended to impose redundant activities on areas where tasks are complete. Attention, however, is directed to the need for System Safety assessment of completed tasks to assure that the intent of Reference (a) has been accomplished.

The specific areas of Reference (a) which are to be applied to the Apollo Applications Program are delineated in the following paragraphs.

- A. Signature page applies as written.
- B. Paragraphs 1, 2, and 3 - "Scope, Documents and Definitions" apply as written.
- C. Paragraph 4.1 - "System Safety Plan", applies as written and shall reflect the policy outlined in Section III. Each Center will assess its program requirements and formulate a System Safety Plan as required by Reference (a), Paragraph 1.2 - "Application". If no System Safety Plan is required to support a specific activity/contract, a statement justifying deletion of this requirement will be submitted to the responsible agency.

¹A distinction is made between NASA Centers and contractors with respect to audits. "Formal Audits" are reserved for contractors and Center elements which design and/or fabricate critical operational hardware items. Conformance to safety requirements by such Center support elements as Flight Operations, Medical Research and Operations, Flight Crew Operations, etc., may be accomplished by assessment of planning and output documentation.

- D. Paragraph 4.2 - "Hazard Analyses". The requirements for Hazard Analyses will be met by utilization of Failure Mode and Effects Analyses developed in accordance with Reference (b). These analyses may be expanded as required to include consideration of hazardous commodities and operations. Paragraph 4.2.1 and 4.2.2 - "Preliminary and Detailed Hazard Analyses", are not commensurate with the current development phases of many AAP elements. In these cases, the intent will be met by performing a hazard assessment as outlined in Paragraph 4.1.3 - "Program Review", and treating the results of this hazard assessment as outlined in Paragraph 4.3 - "Hazard Reduction Precedence Sequence".
- E. Paragraph 4.2.3 - "Operating Hazard Analyses" will be applied as is.
- F. Paragraph 4.3 - "Hazard Reduction Precedence Sequence", shall be applied as is.
- G. Paragraph 4.4 - "Safety Training and Certification", shall be applied as written.
- H. Paragraph 4.5 - "Human Engineering", shall be applied as is with the following exception. If the stage of completion of a task makes this requirement impractical, an assessment will be made to determine if any residual hazards exist and if so they will be disposed of as outlined in Paragraph 4.3.5, "Residual Hazards". It is anticipated that crew station reviews by the flight crews will contribute significantly to a Human Engineering evaluation of the AAP Hardware.
- I. Paragraph 4.6 through 4.10 will be applied as is.
- J. Section 5 - "System Safety Implementation Assurance" shall be applied as is.

V. SAFETY ANALYSIS REPORTS

The NASA Safety Manual (NHB 1700.1) established a requirement for submission of a Safety Analysis Report. For AAP, this report shall be in a memorandum form, and contain key problems affecting crew safety which have been resolved as well as a discussion of residual risks of a significant nature. The aim of this report is to document safety concerns for discussion at the Administrators briefing for each mission and the level of problem discussion should be so tailored. The report should be available in sufficient time to be reviewed in advance of that briefing.

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VI. TEST OPERATIONS

A program for the elimination and/or minimization of hazards associated with test operations shall be accomplished. This program shall include safety analysis of procedures, performance of operational readiness inspections of test facilities and equipment, and monitoring of tests.

VII. MANNED SPACE FLIGHT AWARENESS

Reference (c) establishes the objectives, responsibilities, and requirements for the conduct of Manned Space Flight Awareness programs. This reference is applicable to AAP.

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